

REMARKS

The present Amendment amends claims 21, 24, 27, 34 and 37, leaves claims 23, 26, 29, 32, 34-36 and 38-42 unchanged and cancels claims 28 and 33.

Therefore, the present application has pending claims 21, 23, 24, 26, 27, 29-32 and 34-42.

Claim 34 stands objected to due to informalities noted by the Examiner in paragraph 6 of the Office Action. Amendments were made to claim 34 to correct the informalities noted by the Examiner. Therefore, this objection is overcome and should be withdrawn.

Claims 21 and 24 stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1 and 2 of prior Patent No. 6,581,128. Applicants do not agree with this rejection. However, in order to expedite prosecution of the present application filed on even date herewith is a Terminal Disclaimer obviating this rejection. Therefore, reconsideration and withdrawal of this rejection is respectfully requested.

It should be noted that the filing of the Terminal Disclaimer was not intended nor should it be considered as an agreement on Applicants part that the features of the present invention as recited in claims 21 and 24 are taught or suggested by claims 1 and 2 of the prior patent. The filing of the Terminal Disclaimer was simply intended to expedite prosecution of the present application.

Claims 21, 23, 24, 26-33 and 37-40 stand rejected under 35 USC §103(a) as being unpatentable over Hashemi (U.S. Patent No. 5,327,414) in view of Nakamura (U.S. Patent No. 5,388,013); claims 34, 35, 41 and 42 stand rejected 35 USC §103(a) as being unpatentable over Hashemi in view of Nakamura and further in

view of Cheney (U.S. Patent No. 5,285,456); and claim 36 stands rejected under 35 USC §103(a) as being unpatentable over Hashemi in view of Nakamura and Dixon (U.S. Patent No. 4,637,024). As indicated above, claims 28 and 33 were canceled. Therefore, these rejections with respect to claims 28 and 33 is rendered moot. These rejections with respect to the remaining claims are traversed for the following reasons. Applicants submit that the features of the present invention as recited in claims 21, 23, 24, 26, 27, 29-32 and 34-42 are not taught or suggested by Hashemi, Nakamura, Cheney or Dixon whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

The present invention as now more clearly recited in the claims is directed to a storage system such as that illustrated in Fig. 1 of the present application having a plurality of first logical units 1 coupled to at least one host device, which form interfaces for the host device, a plurality of storage devices 5 for storing therein data transferred from the host device, a plurality of second logical units 2 coupled to the storage devices, at least one cache memory unit 3 for temporarily storing data therein transferred between the first logical units 1 and the second logical units 2 and at least one pass 4 coupled to the first logical units 1, the second logical units 2 and the at least one cache memory unit 3 which transfers data among the first logical units 1, the second logical units 2 and the at least one cache memory unit 3. Unique according to the present invention is that the plurality of storage devices 5 includes a format converter 7 such as that illustrated in Fig. 2 of the present application for converting a count key data (CKD) format of data sent from the host device into a fixed block architecture (FBA) formats suitable for the storage devices and sending

converted data of the FBA format to the at least one cache memory unit 3 through the at least one pass 4 and the at least one cache memory unit 3 stores the data of the FBA format converted by the format converter 7.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, the above described features of the present invention now more clearly recited in the claims are not taught or suggested by Hashemi, Nakamura, Cheney or Dixon whether taken individually or in combination with each other as suggested by the Examiner.

In the Office Action, in the paragraph bridging pages 11 and 12, the Examiner readily admits that:

"Hashemi does not teach the further limitation of the format converter within the storage system"

However, the Examiner alleges that this teaching is supplied by Nakamura and that one of ordinary skill in the art at the time the invention was made would have known to employ the format converter as taught by Nakamura in the storage system as taught by Hashemi. The Examiner is completely in error in this regard.

As admitted by the Examiner, Hashemi certainly does not teach or suggest the conversion of records from the CKD format into records of the FBA format. Nakamura teaches the conversion of records from the CKD format into records of the FBA format. However, as is clear from Figs. 1 and 2 of Nakamura, the channel server 51 disposed between the host 1 and the cache memory 6 stores a CKD format of data sent from the host in the cache memory in a form not corresponding to the FBA format. Nakamura specifically teaches in col. 10, lines 57-64 that when

performing the CKD to FBA format conversion it is assumed that a software is running on the host computer 1 for making access to data recorded in a CKD or variable length format. To this end, Nakamura teaches that a CKD command 4 is issued from the software to the magnetic disk controller 5 via the channel 2b.

Nakamura further teaches, for example, in col. 10, line 68 through col. 11, line 16 that:

“the magnetic disk controller 5 stores these variable length records 3a, 3b and 3d in the cache memory 6. In that case, a track image 7 in the CKD or variable length format is reconstituted on the cache memory 6. More specifically, the CKD track image 7 is constituted by an array of the variable length records 3a, 3b and 3c disposed sequentially in this order from the start or forefront of the track. According to the hither to known method, the inter-field gaps as well as the inter-record gaps have been generated and added or inserted into the track image. On the contrary, according to the teachings of the invention incarnated in the instance embodiment, these gaps are all removed. The magnetic disk controller 5 converts the CKD track image 7 formed on the cache memory 6 to a record 8 of the FBA format”.

Thus, Nakamura does not teach or suggest the above described features of the present invention wherein CKD format data is converted into FBA format data by a format converter included in the storage system, namely the host adaptor, sending the FBA format data to the cache memory and storing the FBA format data converted by the format converter in the cache memory. Such features are clearly not taught or suggested by Nakamura.

Therefore, Nakamura fails to teach or suggest a storage system including a plurality of storage devices which include a format converted for converting CKD format of data sent from the host device into FBA format suitable for the storage

devices and sending the converted data of the FBA format to the cache memory unit so as to permit the cache memory unit to store the data of the FBA format converted by the format converter as recited in the claims.

The above described deficiencies of both Hashemi and Nakamura are not supplied by any of the other references of record particularly Cheney and Dixon. Cheney is simply relied upon by the Examiner for an alleged teaching of adding a CRC code to the data and Dixon is relied upon by the Examiner for an alleged teaching that by using the CRC code, the data can be checked/verified for any errors and if any error is found in the data using the ECC so that the error can be corrected. These teachings of Cheney and Dixon do not supply the above noted deficiencies of Hashemi and Nakamura.

Therefore, even if Hashemi and Nakamura are combined with one or more of Cheney and Dixon, the combination would still be deficient of the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the above described rejections of the claims under 35 USC §103(a) as being unpatentable over the combination of Hashemi and Nakamura with one or more of Cheney and Dixon is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 21, 23, 24, 26, 27, 29-32 and 34-42..

In view of the foregoing amendments and remarks, Applicants submit that claims 21, 23, 24, 26, 27, 29-32 and 34-42 are in condition for allowance. Accordingly, early allowance of claims 21, 23, 24, 26, 27, 29-32 and 34-42 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.33021CX5).

Respectfully submitted,

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